CLAIMS

1. A method for configuring interconnection between optical networks including a first network and a second network each including a plurality of nodes, a first node of the first network being connected with a third node of the second network and a second node of the first network being connected with a fourth node of the second network, said method comprising the steps of:

(a) setting-up a first path between one of the first node and the second node and another node in the first network; and

(b) via the first path and at least one of the link between the first node and the third node and the link between the second node and the fourth node, setting up the path between said another node in the first network and another node in the second network.

2. The method according to claim 1, wherein said another node in the first network is a source node or the destination node, while said another node in the second network is a corresponding destination node or source node, and the path is from the source node to the destination node.

3. The method according to claim 2, wherein the first network is a mesh network and the second network is a ring network, and the third node and the fourth node have drop-and-continue function.

4. The method according to claim 3, further comprising the step of: if SNCP is used in the mesh network, besides setting-up the first path, a second path is setup between said another node in the first network and one of the first node and the second node which is not used for setting-up the first path, and the same communication as that performed in the first path is performed between the mesh network and the ring network via the second path.

5. The method according to claim 4, wherein for a path from the ring network to the mesh network, the first path and the second path is selected at the destination node to receive the path; and for the path from the mesh network to the ring work, the source node transmits the path to the first path and the second path in parallel.

6. The method according to claim 3, further comprising the steps of: if the restoration scheme is used in the mesh network, a restoring path is setup between said another node of the first network and one of the first node and the second node which is not used for setting-up the first path, wherein the node in the first network used for setting-up the first path is the primary node, and the node used for setting-up the restoring path is the secondary node.

7. The method according to claim 6, wherein the path transmitted from the ring network to the mesh network enters the primary node and the secondary node in the mesh network via the third node and the fourth node, respectively.

8. The method according to claim 7, wherein the path of the fourth node is routed to the third node, and the path selection is carried out at the third node.

9. The method according to claim 6, wherein the path transmitted from the ring network to the mesh network enters the primary node and the secondary node in the mesh network via the fourth node and the third node, respectively.

10. The method according to claim 9, wherein the path at the third node is routed to the fourth node, and the path selection is carried out at the fourth node.

11. The method according to claim 7 or 9, wherein the path entering the secondary node is routed to the primary node, and the path selection is carried out at the primary node, and the path is transmitted to the destination node via the first path, wherein the primary node and the secondary node have drop-and-continue function.

12. The method according to claim 6, wherein after entering the third node and the fourth node, respectively, the path transmitted from the mesh network to the ring network is routed to the third node from the fourth node, the path selection is carried out at the third node, and the selected path is passed to the destination node via the ring network.

13. The method according to claim 12, wherein the path enters the secondary node from the primary node in the mesh network, then enters the third node and the fourth node in the ring network via the primary node and the secondary node, respectively.

14. The method according to claim 6, wherein after entering the third node and the fourth node, respectively, the path transmitted from the mesh network to the ring network is routed from the third node to the fourth node, the path selection is carried out at the fourth node, and the selected path is passed to the destination node via the ring network.

15. The method according to claim 14, wherein the path enters the secondary node from the primary node in the mesh, then enters the fourth node and the third node in the ring network via the primary node and the secondary node, respectively.

16. The method according to claim 12 or 14, wherein the path enters the third node and the fourth node from the primary node of the mesh network.

17. The method according to claim 6, wherein the first path is associated with the backup path, and the backup path is used as a working path when the first path falls into failure.

18. The method according to claim 6, wherein the setting-up scheme of the backup path is: when receiving a notification message from the destination node or the failure node and having confirmed the failure is in the mesh network, the restoration path selection is calculated in real time and the backup path is setup.

19. The method according to claim 6, wherein the setting-up scheme of the backup path is: the backup path is pre-calculated, and the backup path is setup when receiving the notification message from the destination node or the failure node and having confirmed the failure is in the mesh network.

20. The method according to claim 6, wherein the setting-up scheme of the backup path is: the backup path is pre-calculated, the resource required for setting-up the path is reserved in advance by signaling process, and the backup path is setup when receiving a notification message from the destination node or the failure node and having confirmed the failure is in the mesh network, wherein the resource is not allocated when reserving the resource in advance.

21. The method according to claim 6, the backup path is pre-calculated, the resource required for setting-up the path is reserved in advance by signaling process, and the backup path is setup when receiving a notification message from the destination node or the failure node and having confirmed the failure in the mesh network, wherein the resource is allocated when reserving the resource in advance.

22. The method according to claim 6, wherein for the path transmitted from the ring network to the mesh network, if the failure happens in the mesh network, the destination node or other nodes in the mesh network which have detected the failure send a notification message about the failure to the primary node or the secondary node in the mesh network via signaling network, having determined that the failure is located within the mesh network , the secondary node initiates the restoration process and setup a backup path based on information on the backup path to restore the path.

23. The method according to claim 6, wherein for the path transmitted from the mesh network to the ring network, if the failure happens within the mesh network, the failure will be detected by the primary node in the mesh network and the node at the side of the failure node, if it is determined that the failure is in the mesh network, a notification message will be sent to the source node via signalling network, and the source node will initiate the restoration process to setup the backup path to the secondary node for the path, the path of the backup path is selected at the secondary node through which the path of the backup path enters the ring network, therefore the path is restored.

24. The method according to claim 6, wherein for the bi-directional path between the mesh network and the ring network, if the failure happens within the mesh network, the failure will be detected by the corresponding destination node and the nodes at both sides of the failure node in the mesh network which will determine that the failure occurs in the mesh network, a notification message will be sent to the source node/destination node via the signaling network, the source node/destination node will initiate a restoration process for setting-up the backup path to the secondary node for the bi-directional path so as to restore the path.

25. The method according to claim 1 or 2, wherein both the first network and the second network are mesh networks.

26. The method according to claim 1 or 2, wherein a plurality of the first networks are interconnected with a plurality of the second networks.

27. The method according to claim 25, wherein all of the first, the second, the third and the fourth nodes all have drop-and-continue function and path selection function.

28. An inter-network interconnection structure of optical networks, comprising:

a first network having a plurality of nodes including a first node and a second node;

a second network having a plurality of nodes including a third node and a fourth node, the first node being connected with the third node and the second node being connected with the fourth node;

a first path for connecting the first node or the second node with another node in the first network;

wherein the path communication is performed between said another node in the first network and another node in the second network via the first path and at least one of the link between the first node and the third node and the link between the second node and the fourth node.

29. The inter-network interconnection structure according to claim 28, wherein said another node in the first network is a source node or a destination node, while said another node in the second network is the corresponding destination node or source node, the path is transmitted from the source node to the destination node.

30. The inter-network interconnection structure according to claim 28, further comprising a second path setup between said another node in the first network and one of the first node and the second node which is not used for setting-up the first path.

31. The inter-network interconnection structure according to claim 30, wherein the first path and the second path is selected at the destination node to receive the path, and the source node transmits the path to the first path and the second path in parallel.

32. The inter-network interconnection structure according to claim 29, further comprising a backup path setup between said another node in the first network and one of the first node and the second node which is not used for setting-up the first path.

33. The inter-network interconnection structure according to claim 32, further comprising: a distributed control processing unit, which is located in or connected electrically with the respective nodes and is used for setting-up the backup path based on different restoration strategies adopted by the first network.

34. The inter-network interconnection structure according to claim 29, wherein the node can be any of SDH/SONET node equipment, OXC equipment, OADM equipment, DXC equipment or ASON equipment.

35. The inter-network interconnection structure according to any one of claim 29, 30 and 32, wherein the first network is a mesh network and the second network is a ring network.

36. The inter-network interconnection structure according to any one of claim 29, 30 and 32, wherein both the first network and the second network are mesh networks.

37. The inter-network interconnection structure according to claim 31, further including path selectors which are used for the selection of the first path and the second path.